THAT WHICH IS CLAIMED:

1. A system for encoding and decoding data for secure transmission, comprising:

an encryption system, wherein said encryption system is operable to receive plaintext and to perform an inverse wavelet transformation over a finite field on said plaintext to produce cyphertext; and

a decryption system in communication with said encryption system, wherein said decryption system is operable to receive said cyphertext and to reproduce said plaintext by performing a wavelet transformation over a finite field on said cyphertext.

2. The system of claim 1, wherein said cyphertext comprises either block cyphertext or stream cyphertext.

3. The system of claim 1, wherein said encryption system includes at least one filter for performing an inverse wavelet transformation over a finite field on said plaintext to produce said cyphertext.

4. The system of claim 3, wherein said at least one filter comprises a digital filter, and wherein said digital filter is configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients defined to perform said mathematical inverse wavelet transformation on said plaintext.

5. The system of claim 1, wherein said decryption system includes at least one filter for performing a wavelet transformation over a finite field on said cyphertext to produce said plaintext.

6. The system of claim 5, wherein said at least one filter comprises a digital filter, and wherein said digital filter is configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients defined to perform said mathematical wavelet transformation on said cyphertext.

7. The system of claim 1, wherein said encryption system includes at least one feedback loop.

8. The system of claim 1, wherein said decryption system includes at least one feedforward loop.

9. The system of claim 1, wherein said encryption system includes at least one non-linear device.

10. The system of claim 1, wherein said decryption system includes at least one non-linear device.

11. The system of claim 1, wherein said encryption system and said decryption system are operable to encoding and decoding data used in at least one operation chosen from the group of operations consisting of authentication, hashing, and signature verification.

12. The system of claim 1, wherein said encryption system is further operable to perform a second inverse wavelet transformation over a finite field to produce cyphertext, and wherein said decryption system is further operable to perform a second wavelet transformation over a finite field to reproduce said plaintext.

13. The system of claim 12, further comprising at least one non-linear device.

14. A system for encoding and decoding data for secure transmission, comprising:

an encryption system, wherein said encryption system is operable to receive plaintext and to perform a wavelet transformation over a finite field on said plaintext to produce cyphertext; and

a decryption system in communication with said encryption system, wherein said decryption system is operable to receive said cyphertext and to reproduce said plaintext by performing an inverse wavelet transformation over a finite field on said cyphertext.

15. The system of claim 14, wherein said cyphertext comprises either block cyphertext or stream cyphertext.

16. The system of claim 14, wherein said encryption system includes at least one filter for performing a wavelet transformation over a finite field on said plaintext to produce said cyphertext.

17. The system of claim 16, wherein said at least one filter comprises a digital filter, and wherein said digital filter is configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients defined to perform said mathematical wavelet transformation on said plaintext.

18. The system of claim 14, wherein said decryption system includes at least one filter for performing an inverse wavelet transformation over a finite field on said cyphertext to produce said plaintext.

19. The system of claim 18, wherein said at least one filter comprises a digital filter, and wherein said digital filter is configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients defined to perform said mathematical inverse wavelet transformation on said cyphertext.

20. The system of claim 14, wherein said encryption system includes at least one feedback loop.

21. The system of claim 14, wherein said decryption system includes at least one feedforward loop.

22. The system of claim 14, wherein said encryption system includes at least one non-linear device.

23. The system of claim 14, wherein said decryption system includes at least one non-linear device.

24. The system of claim 14, wherein said encryption system and said decryption system are operable to encoding and decoding data used in at least one operation chosen from the group of operations consisting of authentication, hashing, and signature verification.

25. The system of claim 14, wherein said encryption system is further operable to perform a second wavelet transformation over a finite field to produce cyphertext, and wherein said decryption system is further operable to perform a second inverse wavelet transformation over a finite field to reproduce said plaintext.

26. The system of claim 25, further comprising at least one non-linear device.

27. An encoder for enabling encryption of an plaintext, comprising means for receiving an plaintext and means for performing a mathematical inverse wavelet transformation over a finite field on said plaintext to produce cyphertext.

28. The encoder of claim 27, wherein said cyphertext is selected from the group consisting of block data or stream data.

29. The encoder of claim 27, wherein said means for performing a mathematical inverse wavelet transformation is a filter.

30. The encoder of claim 27, wherein said means for performing a mathematical inverse wavelet transformation is a digital filter, said digital filter configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients being defined to perform said mathematical inverse wavelet transformation on said plaintext.

31. The encoder of claim 27, wherein said means for performing a mathematical inverse wavelet transformation is an analog filter, said analog filter configured to exhibit a predefined transfer function defined by a set of predefined filter parameters, said predefined filter parameters defining said mathematical inverse wavelet transformation.

32. The encoder of claim 27, further comprising a means for performing a mathematical wavelet transformation over said finite field on said plaintext, in addition to said mathematical inverse wavelet transformation, in order to produce said cyphertext.

33. The encoder of claim 37, further comprising a means for communicating said cyphertext over a wireless communication medium.

34. An encoder for enabling encryption of an plaintext, comprising means for receiving an plaintext and means for performing a mathematical wavelet transformation over a finite field on said plaintext to produce cyphertext.

35. A method for transmitting encrypting data, comprising the steps of:

receiving plaintext;

performing a mathematical wavelet transformation over a finite field on said plaintext to produce cyphertext; and

transmitting said cyphertext.

36. The method of claim 35, wherein the step of performing a mathematical wavelet transformation comprises the step of performing a mathematical inverse wavelet transformation.

37. The method of claim 35, further comprising the steps of:

receiving said plaintext at a digital filter; and

implementing said performing step by causing said digital filter to exhibit a predefined transfer function defined by a set of predefined filter coefficients.

38. The method of claim 35, further comprising the steps of:

receiving said plaintext at an analog filter; and

implementing said performing step by causing said analog filter to exhibit a predefined transfer function defined by a set of predefined filter parameters, said predefined filter parameters defining said mathematical inverse wavelet transformation.

39. The method of claim 35, further comprising the step of performing a mathematical wavelet transformation over said finite field on said plaintext, in addition to said mathematical inverse wavelet transformation, to produce said cyphertext.

40. A decoder, comprising a means for receiving cyphertext and for performing a mathematical wavelet transformation over a finite field on said cyphertext to produce an plaintext.

41. The decoder of claim 40, wherein said means is at least one filter.

42. The decoder of claim 40, wherein said decoder includes means operable to perform a mathematical inverse wavelet transformation in addition to performing said mathematical wavelet transformation.

43. The decoder of claim 40, further comprising a means for deriving a plurality of wavelet coefficients based upon said cyphertext to produce said plaintext.

44. The decoder of claim 40, wherein said means is a digital filter, said digital filter configured to exhibit a predefined transfer function defined by a set of predefined filter coefficients, said filter coefficients being defined to perform said mathematical wavelet transformation on said cyphertext.

45. The decoder of claim 40, wherein said means is an analog filter, said analog filter configured to exhibit a predefined transfer function defined by a set of predefined filter parameters, said predefined filter parameters defining said mathematical wavelet transformation.

46. The decoder of claim 40, further comprising a means for receiving said cyphertext from a wireless communications medium.

47. A method for encoding and decoding data for secure transmission, comprising:

receiving plaintext at an encryption system;

performing an inverse wavelet transformation over a finite field on said plaintext to produce cyphertext;

receiving said cyphertext at a decryption system in communication with said encryption system; and

reproducing said plaintext by performing a wavelet transformation over a finite field on said cyphertext.

48. The method of claim 47, wherein said cyphertext comprises either block cyphertext or stream cyphertext.

49. The method of claim 47, further comprising performing an inverse wavelet transformation over a finite field on said plaintext to produce cyphertext using at least one.

50. The method of claim 49, wherein said at least one filter exhibits a predefined transfer function defined by a set of predefined filter coefficients, and wherein

said filter coefficients are used to perform said mathematical inverse wavelet transformation on said plaintext.

51. The method of claim 47, wherein the step of reproducing said plaintext by performing a wavelet transformation over a finite field on said cyphertext comprises reproducing said plaintext using at least one filter for performing a wavelet transformation over a finite field on said cyphertext to produce said plaintext.

52. The method of claim 47, wherein said step of performing an inverse wavelet transformation includes performing an inverse wavelet transformation using at least one feedback loop.

53. The method of claim 47, wherein said step of performing a wavelet transformation includes performing a wavelet transformation using at least one feedforward loop.

54. The method of claim 47, wherein said step of performing an inverse wavelet transformation includes performing an inverse wavelet transformation using at least one non-linear device.

55. The method of claim 47, wherein said step of performing a wavelet transformation includes performing a wavelet transformation using at least one nonlinear device.